

Code No: 152AB

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

CHEMISTRY

(Common to CE, ME, ECE, EIE, MCT, MMT, AE, MIE, PFM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) Write the molecular orbital electronic configurations of  $O_2$ . [2]
- b) How can we recover exhausted ion exchange resins? [2]
- c) What is battery? And discuss the types of batteries. [2]
- d) Define the terms enantiomers and diastereomers. [2]
- e) What are the conditions for molecule to be IR active? [2]
- f) Define conductors and semi conductors on the basis of Band theory [3]
- g) A sample of hard water contains the following dissolved salts per litre.  
 $Ca(HCO_3)_2 = 16.4$  mgs,  $Mg(HCO_3)_2 = 14.6$ mgs,  $CaCl_2 = 111$ mgs,  
 $MgSO_4 = 12$ mgs,  $CO_2 = 44$ mgs and  $CaSO_4 = 13.6$  mgs.  
Calculate temporary and permanent hardness of water in ppm and in degree Clarke. [3]
- h) Explain how nature of metals effects the rate of corrosion [3]
- i) What are stereoisomers, and what is optical activity? [3]
- j) What do you mean by absorbance and transmittance? [3]

PART-B

(50 Marks)

- 2.a) Explain the crystal field theory for the square planar complexes of transition metals.
  - b) Draw the molecular orbital energy diagram of  $F_2$  molecule. Calculate its Bond order and predict its magnetic behavior.
  - c) Explain  $\pi$  molecular orbital diagram of 1,3-butadiene. [4+3+3]
- OR
- 3.a) What is doping agent? Explain how the dopant will effect the conductivity of semi conductors.
  - b) Discuss the reasons for crystal field splitting of d-orbitals. Explain the splitting of d-orbitals in octahedral complexes.
  - c) Discuss the assumption of molecular orbital diagram. [4+3+3]
- 4.a) Discuss the principle involved in EDTA method? Explain Estimation of hardness of water by complex metric method.
  - b) 0.28 g of  $CaCO_3$  was dissolved in dil.HCl and the solution made up to one litre with distilled water. 100 ml of the above solution required 28 ml of EDTA solution for titration. 100ml of the water sample required 33 ml of same EDTA solution for titration. After boiling, 100ml of this water, cooling, filtering and then titration required 10ml of EDTA solution. Calculate the temporary and permanent hardness in water.
  - c) Write a brief account on break-point chlorination. [4+3+3]

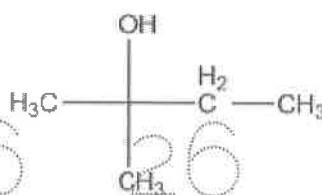
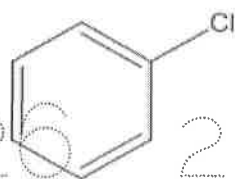
OR

- 5.a) What is the principle involved in internal treatment of boiler feed water and discuss the types of internal treatment methods.  
b) What is hardness of water due to? What are its units? Explain the different types of hardness of water?  
c) Explain the desalination of water by Reverse osmosis process. [4+3+3]
- 6.a) What is a reference electrode? Explain the functioning of Quinhydrone electrode with Nernst equation.  
b) What is electrochemical series? Write its applications.  
c) Give a brief account on lead –acid storage cell. [4+3+3]

OR

- 7.a) What is oxidation corrosion and how does it take place? Describe the mechanism of oxidation corrosion.  
b) Explain impressed current method of corrosion control with a neat diagram.  
c) Write a note on galvanizing. [4+3+3]
- 8.a) Explain different conformations of n-Butane with the potential energy diagram.  
b) Give the structure, synthesis and applications of paracetamol.  
c) Why does  $SN^2$  reactions give rise to inversed product? Explain. [4+3+3]
- 9.a) Give Grignard addition reactions on carbonyl compounds.  
b) What is markownikoff rule? Explain with suitable- example.  
c) Discuss the mechanism involved in oxidation of alcohols using  $KMnO_4$ . [4+3+3]

- 10.a) Discuss the type electronic transitions in U.V spectra?  
b) Calculate the theoretical number of vibrational degree of freedom of  
i)  $CO_2$  ii) Water iii)  $SO_2$   
c) Predict the NMR –spectrum of  
i) ii)



OR

- 11.a) What is meant by term chemical shift. Explain the factors influencing chemical shift.  
b) Discuss the applications of UV Spectroscopy.  
c) Give an account of various fundamental vibrations in IR spectra. [4+3+3]

---ooOoo---

Code No: 152AE

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

APPLIED PHYSICS  
(Common to EEE, CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) Define Compton effect. [2]
- b) Draw Zener diode symbol and explain any one break down mechanism. [2]
- c) Write any four applications of LED. [2]
- d) What is the need of the Pumping process in lasers? [2]
- e) Define dielectric constant. [2]
- f) Explain the significance of Quantum physics. [3]
- g) Distinguish between Intrinsic and Extrinsic semiconductors. [3]
- h) Explain term recombination mechanisms in semiconductors. [3]
- i) Explain total internal reflection. [3]
- j) What is significance of permeability in magnetic materials? [3]

PART-B

(50 Marks)

- 2.a) With neat diagram explain Davisson and Germer experiment.
  - b) Write a note on Black body radiation. [5+5]
- OR
- 3.a) Derive an expression of Schrodinger's time independent wave equation.
  - b) Discuss Heisenberg's Uncertainty principle. [6+4]
- 4.a) How Zener diode is different to normal diode? Draw its V-I Characteristics.
  - b) Explain the term diffusion and drift. [6+4]
- OR
- 5.a) Explain construction, Principle of operation of Bipolar Junction Transistor (BJT).
  - b) Discuss formation of p-n junction diode. [6+4]
- 6.a) Describe in detail, with a neat diagram Solar cell construction and working principle.
  - b) In detail discuss PIN diode working principle. [5+5]
- OR
- 7.a) With neat diagram explain construction and working principle of semiconductor laser.
  - b) What are the characteristics of LED? [6+4]

- 26 26 26 26 26 26 26 2
- 8.a) With necessary theory and energy level diagram explain the working of Ruby laser.  
b) With help diagrams explain differences between Step and Graded index optical fibers? [5+5]

OR

- 26 26 26 26 26 26 26 2
- 9.a) Explain how Optical-fiber acted as a dielectric wave guide.  
b) Describe Population and Population inversion in lasers. [5+5]

- 10.a) Explain clearly the phenomenon of ferro electricity.  
b) What is Piezoelectricity? Write the applications of Piezoelectricity materials. [5+5]

OR

- 26 26 26 26 26 26 26 2
- 11.a) What are Laws of electrostatics.  
b) Explain Hysteresis of a ferromagnetic material. [5+5]

---ooOoo---

**R16**

Code No: 132AD

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B.Tech I Year II Semester Examinations, August - 2019**

**COMPUTER PROGRAMMING IN C**  
(Common to EEE, ECE, CSE, EIE, IT, ETM)

Time: 3 hours

Max. Marks: 75

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART- A**

**(25 Marks)**

- 1.a) Write about Program Development steps in brief.
- b) Write a flowchart for electricity bill payment.
- c) Explain about scope rules.
- d) Explain types of Arrays in brief.
- e) Write about Pointer Arithmetic with an example.
- f) Write a program for arrays of pointers in C.
- g) Explain self referential structures in brief.
- h) Write short note on Enumerations.
- i) Write about File streams.
- j) Write a program for Opening and Closing files.

[2]  
[3]  
[2]  
[3]  
[2]  
[3]  
[2]  
[3]  
[2]  
[3]

**PART-B**

**(50 Marks)**

- 2.a) Explain in detail about Selection Statements in C.
  - b) Define Algorithm, Explain with an example.
- OR**
- 3.a) Explain in detail about Computer Languages.
  - b) Discuss about Expressions in detail.

[5+5]  
[5+5]

- 4.a) Explain types of Functions.
- b) Explain multidimensional arrays in detail.

[5+5]

- OR**
- 5.a) Write a program to implement bubble sort.
  - b) Explain about recursive functions in detail.

[5+5]

- 6.a) Discuss about Pointers for inter function communication.
- b) Explain about String manipulation functions.

[5+5]

- OR**
- 7.a) Explain in detail about void pointer with examples.
  - b) Explain String Concepts in detail.

[5+5]

26 26 26 26 26 26 26 2

8.a) Define Structure and explain initialization of structures with an example.

b) Discuss about Pre-processor commands.

[5+5]

26 26 26 26 OR 26 26 26 2

9.a) Write a C program to implement unions.

b) Explain functions with an example program.

[5+5]

10.a) Explain Binary File modes in brief.

b) Write a C program to implement feof() and ferror() functions.

[5+5]

26 26 26 26 OR 26 26 26 2

11.a) Explain about fseek(), ftell() and rewind() file functions with examples.

b) Write a C program reverse the contents of a given file.

[5+5]

---ooOoo---

26 26 26 26 26 26 26 2

26 26 26 26 26 26 26 2

26 26 26 26 26 26 26 2

26 26 26 26 26 26 26 2

26 26 26 26 26 26 26 2